ANNUAL REPORT

LABORATORY AND X-RAY SERVICES DIVISION

MANITOBA HEALTH SERVICES COMMISSION

APRIL 1, 1982 – MARCH 31, 1983

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April 1, 1982 - March 31, 1983

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Laboratory and X-ray Services Division
Manitoba Health Services Commission
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Laboratory & X-Ray Services Division
Annual Report
1982-83

Introduction:

The Laboratory & X-Ray services Division of the Manitoba Health Services Commission is comprised of two main components: the rural laboratory & x-ray units (LAXUS) and the Cadham Provincial Laboratory (CPL).

The CPL provides diagnostic and public health services including bacteriology, virology, mycology, parasitology, serology and metabolic screening and LAXUS provides diagnostic services encompassing laboratory, x-ray, Ultrasound and EKG disciplines.

During the 1982-83 fiscal year the Division increased its program evaluation activities to meet the fiscal restraints necessitated by the current economic situation. One major study undertaken by a Community Medicine student, Dr. Brent Friesen was to evaluate the efficacy and efficiency of the pre-marital syphilis testing. As a result of the findings of this study, a recommendation has gone forward to eliminate the pre-marital syphilis test requirement in Manitoba.

Ultrasound was introduced to rural Manitoba during 1982-83 with the first services being located at Dauphin and The Pas.

Computerization of the clinical microbiology laboratory was begun late in the year with the objective of implementing the on-line program by May 1, 1983.

Decentralization of clinical microbiology continued thoughout the year with upgrading of services being completed in Morden, St. Pierre and Beausejour.

SENIOR STAFF LISTING

Division Director	-	J. C. Wilt, M.D., FACP, FRCP, FRC(Path), FRS
Laboratory Physicians	-	J. G. Fox, M.D., FRCP(C), Dip. Bact. (Tor)
	-	G. W. Hammond, M.D., FRCP(C)
	-	J. T. Lunn, M.D., Radiological Diagnostician
	-	L. H. Sekla, M.B., B.Ch., D.M., Ph.D.
	-	T. W. Williams, M.B., B.Ch., DPH, FRCP(C) (Ped & Micro)
Manager, Rural Units	-	M. W. Burroughs, FCAMRT, R.C.T.
Administrative Officer, C.P.L.	-	J. Thompson

Scientists:

Division Physicist	-	D. E. Gelskey, M.S., MPH, Dr. P.H.
Environmental Microbiology	-	W. Stackiw, B. Sc.
Metabolic Diseases	-	R. Hoare, Ph. D.
Microbiology	-	A. C. Maniar, M.Sc., Ph.D., D.Sc.
Serology	-	W. Stackiw, B.Sc.
Virus Isolation	-	G. Ahluwalia, B. Sc.

Regional Supervisors:

Eastern Manitoba: X-ray	-	L. Wilson, R.T., R.C.T.
Laboratory	-	W. Strukoff, DHA, R.T.
Western Manitoba: X-ray	-	E. Carroll, R.T., R.C.T.
Laboratory	-	W. Yaschyshyn, R.T.

Education Officers:

Laboratory	-	A.N.C. Delaat, A.R.T.
X-ray	-	J.D. Brownlee, B.Sc., R.T.

Accounting/Stores:

Accounting Clerk	-	C. McComber
Storekeepers:		
Rural Units	-	Wm. Popoff (Acting)
C.P.L.	-	D. Chapman

Chief Technologists:

C.P.L.:

Clerical Supervisor	-	P. Flint
Clinical Microbiology	-	R. Barker, R.T.
Environ. Microbiology	-	L. VanBuckenhout, R.T.
Metabolic Diseases	-	R. Thompson, R.T.
Serology	-	G. Eibisch, R.T.
Technical Support	-	A. Norrie, R.T.
Virus Isolation	-	B. Klisko, R.T.

SENIOR STAFF LISTING (CONT.)

Rural Units:

Interlake Area	- L. Russell, R.T.
Selkirk	- D. Sirett, R.T.
Southern Area	- L. Baker, R.T.
Swan Valley Area	- E. Kindrat, R.T.
Virden Area	- P. Rocan, R.T., R.C.T.
Southwest Area	- B. Phillips, R.T.
Russell Area	- D. Preston, R.T.
Neepawa Area	- L. Novak, R.T.
Dauphin Area	- E. Slimmon, R.T.
The Pas	- W. Otchnash, R.T.
Flin Flon	- E. Duffily, R.T.

Chief E.C.G. Technologist - L. Brooks, R.C.T. (Adv.)

TABLE

LABORATORY & X-RAY SERVICES DIVISION
WORKLOAD-STATISTICS CANADA UNITS
APRIL 1/82 - MARCH 31/83
WITH COMPARISON TO 81/82

	1981/82			1982/83		
Rural Lab. & X-Ray Units	No. of EKG's	No. of X-Ray Ex.	Statistics Canada Units	No. of EKG's	No. of X-Ray Ex.	Statistics Canada Units
Russell Area	2,481	7,656	667,066	2,684	7,292	641,345
Dauphin Area	9,142	31,333	2,506,979	10,335	30,943	2,197,649
Neepawa Area	3,836	14,577	1,161,504	3,884	13,779	1,149,449
Portage Area	4,372	17,648	1,553,085	4,381	17,049	1,309,873
Killarney Area	3,537	14,064	1,084,125	3,752	14,866	1,075,226
Morden Area	6,494	23,953	2,490,164	6,456	24,990	2,274,224
Selkirk Area	5,977	22,444	1,589,253	5,144	22,203	1,387,767
Swan River Area	2,553	9,077	810,021	2,668	9,109	717,105
Gimli Area	3,077	12,328	1,036,386	2,764	12,066	865,456
Virden Area	4,836	15,755	1,318,718	4,952	15,242	1,246,654
Special Agreement Units	11,289	50,973	4,283,634	11,733	55,666	4,324,264
TOTAL RURAL	57,594	219,808	18,500,935	58,753	223,205	17,189,012
Cadham Prov. Laboratory	No. of Spec.s	No. of Tests	Statistics Canada Units	No. of Spec.s	No. of Tests	Statistics Canada Units
Clinical Microbiology	61,465	91,743	2,235,162	85,400	93,154	2,411,973
Media	-	-	244,354	-	-	278,973
Virus Isolation	8,242	12,403	1,555,848	12,007	15,750	2,062,648
Environmental Microbiology	43,787	103,971	1,809,354	46,155	87,436	1,725,916
Serology	132,422	308,860	4,298,750	133,876	307,224	4,224,294
Metabolic Diseases	32,889	173,688	644,539	32,146	169,876	638,224
Chemistry	-	-	-	4,692	9,015	47,021
TOTAL C.P.L.	278,805	690,655	10,788,007	314,276	682,455	11,388,634
S.C. UNITS LAB.&X-RAY SERVICES DIVISION			29,288,942			28,577,646

Cadham Provincial Laboratory
Workload in Stats Canada Units
By Laboratory Section

April 1/82 - March 31/83
With Comparison to 81/82

	1981/82		1982/83	
	Number of Specimens	Stats Canada Units	Number of Specimens	Stats Canada Units
Clinical Microbiology	61,465	2,235,162	85,400	2,411,973
Media	-	244,354	-	278,558
Virus Isolation	8,242	1,555,848	12,007	2,062,648
Environmental Microbiology	43,787	1,809,354	46,155	1,725,916
Serology	132,422	4,298,750	133,876	4,224,294
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Chemistry	-	-	4,692	47,021
TOTAL	278,805	10,788,007	314,276	11,388,634

CLINICAL MICROBIOLOGY

The general increase in sophistication of rural laboratories and their capabilities in microbiology specifically has reduced the numbers of certain types of specimens being submitted to the Cadham Provincial Laboratory (e.g. throat swabs & urines). This reduction has been more than off-set by the increase in specimens being submitted for identification of Chlamydia trachomatis. These specimens have increased five-fold in the past year indicating greater physician awareness of both the disease and the availability of testing rather than any new epidemic in the Province.

In the 1980 fiscal year the number of enteric isolates which had been fairly constant showed a decline in rate. This decline has continued in both 1981 and 1982 fiscal years. Of note also is the disappearance of the multiple antibiotic resistant Shigella sonnei organisms which had suddenly appeared in 1980 and were ubiquitous throughout the Province that year. This phenomenon is without explanation. Campylobacter and Aeromonas have established themselves as being very frequent isolates from patients with gastroenteritis. Their epidemiological characteristics are still being evaluated.

Isolation rates for toxigenic diphtheria have continued to drop in frequency. The number of submitted specimens for testing has remained constant thus a real drop in prevalence of the organism suggested.

Research and Development:

This section has been very busy throughout the year. Means of assessing the importance of Aeromonas hydrophila have been sought. This work continues as a cooperative study with the University of Manitoba.

A more rapid method for detection of clostridium difficile toxin (a cause of severe, antibiotic-associated, colitis) was devised and its potential assessed in clinical cases in a cooperative study with the University of Manitoba. A more rapid method for detection of N. gonorrhoea organisms (Gonazyme) is being assessed. If successful it could make same day reporting possible. Swabs for procurement of specimens are important. Certain types of these may be toxic for certain organisms and not for others. A widespread search for the "ideal" swab has ended successfully. Transport media of various types have been assessed in order to provide better survival for specimens. Other projects included evaluation of Phadebac, Streptex and various media for enhanced isolation of enteric pathogens. Evaluation of dip-slide cultures is carried out yearly when necessary. The quality of these may change yearly, frequently for the better. Thirteen types were tested this year.

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Clinical Microbiology (Cont.)

Divisional Specialist Technologists

The development of microbiology subsections of rural laboratories has emphasized the need for protracted, intermittent bench-level technological input. During development of a subsection (whether microbiology, chemistry, hematology, x-ray or EKG) highly skilled technical input for one to two weeks is beneficial in establishing correct practises and aiding in smoothing of problems. This is entirely beyond the purview of the Regional Supervisors or Area Chiefs. Furthermore, with the introduction of new testing modalities it is of great benefit to have further input from highly skilled technologists. These goals have been achieved by the development of peripatetic technologists (Divisional Specialist Technologists) who have demonstrated beyond equivocation their inestimable value in this function. Their functions include assisting in modifying tests to suit local exigencies: On-going assessment of local programs: defining problem areas in local programs: Assisting in solving these problems.

Nosocomial Infection Control

Hospital infection control is an integral part of each rural hospitals program. The appointment of a nurse to assist in development of these programs has met with enthusiatic approval from most rural hospitals. Production of a manual to assist rural hospitals to develop their own program has been a major undertaking. It is of note that this manual has received widespread acceptance not only in this province but in other provinces also. This program has been extended to include Personal Care Homes in the Province.

% RESISTANCE OF SELECTED ISOLATES TO SELECTED ANTIBIOTICS

Organism	No.	PENG	AMP	GENT	NAAC	COTRI	CEPOT	TETRA	NITROF	CHLOR	CLOX	ERYTH	CLIND	CARB	TOBRA
Aeromonas	85	-	95	0	0	5	58	5	0	3	-	-	-		
Acinetobacter	171	-	74	<1	22	21	77	8	90	0	-	-	-		
Citrobacter	79	-	72	0	2	13	49	13	2	-	-	-	-		
Enterobacter Agglomerans	66	-	95	0	0	6	48	5	65	-	-	-	-		
Enterobacter Cloacae	122	-	91	<1	2	2	93	12	42	-	-	-	-		
Escherichia Coli	2,972	-	49	<1	2	12	26	18	35	0	-	-	-		
EPEC	42	-	62	0	-	7	36	7	-	2	-	-	-		
Klebsiella	413	-	94	0	3	4	9	6	34	20	-	-	-		
Morazella	36	-	19	0	0	25	8	6	75	-	-	-	-		
Proteus Mirabilis	182	-	34	0	7	9	3	98	96	-	-	-	-		
Proteus Vulgaris	31	-	97	0	0	26	71	68	87	-	-	-	-		
Pseudomonas Aeruginosa	202	-	-	17	-	-	-	-	-	-	-	-	-	15	2
Pseudomonas Species	68	-	-	28	-	-	-	-	-	-	-	-	-	28	33
Salmonella Typhi	5	-	0	0	-	0	0	20	-	0	-	-	-	-	-
Salmonella Species	68	-	12	0	0	0	7	9	0	2	-	-	-	-	-
Serattia	25	-	76	4	0	8	72	60	55	-	-	-	-	-	-
Shigella flexneri	49	-	31	2	-	2	39	46	11	-	-	-	-	-	-
Shigella sonnei	31	-	90	0	-	68	52	13	-	0	-	-	-	-	-
Staphylococcus aureus	2,211	92	-	6	-	-	<1	-	-	<1	0	8	<1	-	-
Staphylococcus epidermidis	1,295	65	-	3	-	-	2	-	-	-	6	19	6	-	-
Streptococcus faecalis	517	-	2	24	94	17	-	59	10	-	-	39	-	-	-

Cadham Provincial Laboratory
Clinical Microbiology Isolates
April 1/82 to March 31/83
With Comparison to 1981/82

	Number of Isolates	
	1981/82	1982/83
Streptococci Group A	2,146	1,746
" Group B	123	685
N. meningitidis	36	14
N. gonorrhoea	1,307	1,703
G. vaginalis	13	1,192
Chlamydia trachomatis	210	877
Bordetella pertussis	3	4
Legionella pneumophilia	2	-
Antibody Coated Bacteria	-	9
Vibrio cholerae	1	-
C. diphtheriae:		
gravis toxigenic	113	78
" atoxigenic	51	26
mitis toxigenic	16	1
" atoxigenic	66	82
intermedius toxigenic	2	3
" atoxigenic	1	3
Total C. diphtheriae	249	193
C. ulcerans toxigenic	1	3
" " atoxigenic	2	6
	3	9

Clinical Microbiology Isolates Cont'd.

	Number of Isolates	
	1981/82	1982/83
Mycobacteria		
AFB on culture	71	112
Positive smears	8	12
Total Mycobacteria	79	124
Mycology		
C. albicans	249	775
C. tropicalis	1	2
Hyphae	15	54
Tinea versicolor	11	24
Trichophyton spp.	-	1
T. mentagrophytes	4	12
T. rubrum	6	26
Aspergillis niger	4	1
Total Mycology	290	945
Enteric Pathogens		
Shigella spp.		
S. flexneri 1	4	1
2	188	147
3	1	3
X	9	2
Y	1	4
Sonnei	198	39
Total Shigella	401	196

Clinical Microbiology Isolates Cont'd.

	Number of Isolates	
	1981/82	1982/83
Enteric Pathogens Cont'd.		
Salmonellae:		
S. Group B. undifferentiated	1	11
S. agona	3	16
S. brandenburg	12	15
S. heidelberg	62	31
S. paratyphi B	1	2
S. saint paul	52	13
S. schwarzengrund	7	17
S. typhi	6	10
S. typhimurium	166	92
S. bareilly	1	1
S. infantis	29	32
S. montevideo	15	-
S. oranienberg	1	-
S. thompson	21	17
S. virchow	-	1
S. Group C2 undifferentiated	3	1
S. blockley	1	2
S. haardt	5	6
S. litchfield	1	-
S. muenchen	57	17
S. newport	11	9
S. Group D undifferentiated	1	1
S. dublin	-	1
S. enteriditis	30	9
S. anatum	2	2
S. lexington	1	-
S. havana	1	-
S. cerro	2	-
S. albany	5	1
S. kentucky	1	-
S. rubislow	3	4
S. arizona	5	-
S. bredeney	2	-
S. hadar	3	-
S. ohio	7	8
S. panama	1	1
S. Group R	1	-
S. java	2	-

Clinical Microbiology Isolates Cont'd.

	Number of Isolates	
	1981/82	1982/83
Enteric Pathogens Cont'd.		
Salmonellae:		
S. derby	-	2
S. melaegridis	-	4
S. breanderap	-	2
S. untypable	-	2
S. Tennessee	-	2
S. New Brunswick	-	11
S. bovis morbificans	-	2
S. california	-	1
S. virchow	-	1
S. amagee	-	2
S. lomalinda	-	1
S. miami	-	1
S. Group C	-	1
S. paratyphi A	-	1
Total Salmonella identifications	524	352
Escherichia Coli Group		
0111:K58	17	12
0119:K69	30	20
0124:K72	4	2
0125:K70	7	18
0126:K71	38	12
0127a:K61	8	-
0127a:k63	2	-
0128:K67	19	17
020a:020c:K61	1	-
026:K60	39	26
055:K59	29	26
086:K61	5	5
09:K57	1	-
018a:019c:K77	1	-
untypable	2	1
126:K60	2	-
0142:K86	-	1
08:K25	-	1
Total Escherichia Coli	205	141

Clinical Microbiology Isolates Con'd.

	Number of Isolates	
	1981/82	1982/83
Campylobacter	180	236
Yersinia	8	11
Aeromonas	211	166
Plesiomonas Shigelloides	23	11
Special Reference Isolates		
N. gonnorrhea		521
C. diphtheriae		75
Salmonella		153
Shigella		10
Enteropathogenic E. Coli		25
G. vaginalis		112
Aeromonas hydrophilia		2
N. meningitidis		11
Campylobacter		14
Chlamydia		2
Group A Strep		2
Antibody Coated Bacteria		8
C. albicans		1
Yersinia		5
N. lactamica		1
B. pertussis		1
C. difficile toxin		27
Acinetobacter spp.		1
Achromobacter spp.		2
Pseudomonas cepacia		7
Clostridium perfringens		9
Pseudomonas fluor.		1

VIRUS DETECTION LABORATORY

The Virus Detection Laboratory is responsible for the detection, isolation and identification of viruses from clinical specimens. Viruses are detected routinely by cultivation in cell culture and increasingly by immunodiagnostic and electron microscopy techniques. The serodiagnosis of coxsackie B virus infections by microneutralization techniques is also performed in this laboratory.

We have witnessed a very dramatic increase in the number of specimens submitted to the Virus Detection Laboratory in the past two to three years with over 11,500 specimens submitted during the current fiscal year, a 45% increase over the previous year. To cope with this growing increase in workload we have changed a number of our routine protocols as follows: the primary incubation of specimens in cell culture has been shortened from 10 to 6 days at which time a repass is performed; we have deleted the repass culture of CSF specimens; we have deleted the routine inoculation of fecal specimens to cell culture during the winter months, when immunodiagnostic and EM techniques are more useful for the detection of viruses; we have instituted a preliminary diagnostic test for rotavirus prior to electron microscopy of fecal specimens; specimens of fecal material are inoculated to BGM cell culture for enterovirus detection only during the summer months; the microneutralization test is to be performed only during the summer months. All these changes have streamlined the laboratory function and operation as much as possible with an attempt to preserve basic standards of virology. Many of these changes originated from information obtained from our routine worksheets which enabled assessment of these protocol alterations. In addition, to improve the detection of CMV, we have increased the duration of culture from specimens of the cervix to enable the detection of cytomegalovirus.

Research and developmental projects continue to be an important part of our work. We have evaluated monoclonal antibodies for the typing of herpes simplex viruses type 1 and 2. A study of the monoclonal antisera produced at the Armand Frappier Institute in Montreal has revealed them to be excellent reagents in a blinded test vs. restriction enzyme analysis of HSV isolates. We have completed an evaluation of the counter-immunoelectrophoresis (CIE) test with its introduction into the diagnostic laboratory for the winter of 1982-83. However, due to problems with occasional false positive detections in neonatal fecal specimens we have continued to evaluate new systems and at present the latex agglutination system (which contains a control preserum), the Rotalux^{R} test appears to be very promising as a rapid preliminary diagnostic test for Rotavirus. An immunologically specific diagnostic test for cytomegalovirus of indirect immunofluorescence is being developed to increase the specificity and to enable more rapid detection of this virus.

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VIRUS DETECTION LABORATORY (Cont.)

Projects of a collaborative nature continue to be run with clinical virological studies.

1. In collaboration with Dr. F. Aoki, we have begun a prospective study of the treatment of recurrent HSV genital infections with the drug Foscarnet^{R}.

2. In conjunction with Dr. F. Aoki, we have continued some collaborative studies on the effectiveness of prevention of influenza and more recently the treatment of acute influenza.

3. A collaborative study investigating viral gastroenteritis, particularly adenovirus and small round enteric viruses as causes of gastroenteritis, is being carried out in conjunction with a grant funded by the NHRDP. Specific advances in the improvements in diagnosis of adenovirus infections which will have relevance to the future functioning of the virus laboratory will include analysis of adenovirus strains by restriction endonuclease, improvements in culture of adenovirus by the use of Graham 293 cells and improvements in the serodiagnosis of adenovirus by serotype.

4. A study to improve the visualization of small round enteric viruses by a variety of negative stains, detected by electron microscopy is being carried out with the Dept. of Med. Micro.

5. We continue to support the investigation of the etiology of CNS infections in Manitoba, in collaboration with a study funded by the NHRDP.

6. Diagnostic virology is being performed in an evaluation of dysplasia of the female uterine cervix, in a study in collaboration with Dr. B. Brunham of the Dept. of Medical Microbiology.

HIGHLIGHTS

1. We welcome Heather Mawhinney who has replaced Shirley Dzogan. We also welcome a new member to the Cadham Laboratory, Gaylene Allan, who has replaced Greg James.

2. A presentation on the CBC news show "The Journal" regarding the diagnosis of influenza in a virus laboratory, was part of a documentary on Influenza. For the winter of 1982-83 we had an extended influenza A season with over 40 isolates, two probable serotypes of influenza H_3N_2, and an isolate of influenza B. Our local influenza surveillance program appears to be working well in providing early specimens of a high quality nature.

VIRUS DETECTION LABORATORY (CONT.)

3. We welcome a new graduate student from the Dept. of Medical Microbiology, Dr. Donald Chan, who will work on improvements in the diagnosis of coxsackie B virus infections.

CELL CULTURE LABORATORY

The cell culture laboratory formulates all media used in the growth of viruses in cell culture, provides quality control of all the media, prepares commercial cell culture for its use and prepares continuously-derived cell culture for the Virus Detection Laboratory. We continue to have excellent cell culture materials for virus detection in the face of markedly increased volume of media and cell culture used, under the guidance of Mr. Richard Drummond. In spite of many advances in immunodiagnosis and other rapid viral techniques, many improvements and advances are still required in the routine use of cell culture in the attempt to grow many viruses from clinical specimens. Further developmental work is required in this area.

Cadham Provincial Laboratory
Virus Isolations
April 1/82 - March 31/83
With Comparison to 1981-82

	1981/82	1982/83
Enterovirus Group		
Polio 1	17	25
Polio 2	22	29
Polio 3	27	26
Polio (mixed)	7	8
Polio Viruses Isolated	73	88
Coxsackie B_2	17	0
B_3	5	1
B_4	2	9
B_5	28	1
A9	1	4
A13	0	1
	53	16
Echo 1	1	3
2	0	5
3	5	23
4	0	1
6	0	1
9	21	0
11	1	1
14	1	3
17	0	2
20	2	0
21	0	1
22	7	16
23	0	1
24	0	1
25	1	2
27	1	0
30	1	2
31	1	0
Unconfirmed	16	30
Not Typed	4	1
	62	93

Virus Isolation Cont.

	1981/82	1982/83
Respiratory Virus		
Influenza A	0	2
A-Brazil	1	0
A-H_3N_2	3	0
A Oregon-like	0	37
A Phillipines-like	0	3
Influenza B Singapore	2	22
Parainfluenza		
Type 1	1	1
Type 2	0	1
Type 3	20	21
Adenovirus		
Type 1	13	31
Type 2	46	61
Type 3	64	14
Type 4	0	2
Type 5	2	6
Type 6	0	3
Type 7	5	10
Unconfirmed	16	30
Not Typed	1	19
Myxovirus Unidentified	1	1
Total Respiratory Viruses Isolated	175	264
Electron Microscopy		
Rotavirus	159	139
Adenovirus	88	54
Herpes	17	24
Small Round Enteric	71	63
Corona	6	3
Reo	2	1
Rota & SREV	3	3
Adeno & SREV	3	8
Rota & Adeno	5	0
SREV, Adeno & Corona	1	0
SREV & Corona	1	0
Molluscum Contagiosum	-	1

Virus Isolation Cont.

	1981/82	1982/83
Miscellaneous		
Reovirus	5	6
Type unknown	1	1
Type 2	0	3
Type 3	0	1
Mumps	2	2
Herpes		
Varicella Zoster	17	18
Cytomegalovirus	18	63
Herpes Simplex	482	928
Rubella	0	1
RSV	0	16
Counter Immunoelectrophoresis positive Rotavirus	0	78
Fluorescence Microscopy		
Herpes Simplex	0	12

TECHNICAL SUPPORT SERVICES

The technical support section continues to provide Quality Control, Media and Washup/Sterilization services to the Cadham Provincial Laboratory and to the Laboratory and X-ray Unit System.

Quality Control Section

This section coordinates an external microbiology proficiency survey offered by the College of American Pathologists. The results obtained by the appropriate subsection of the laboratory from participation in this survey are used as a guideline for accreditation by the College of Physicians and Surgeons of Manitoba.

A procedures manual was developed for Quality Control testing of various media, reagents, blood, etc. and the minimal acceptable results by Ms. K. Kines. This involved researching numerous articles, books, studies both internally and externally to determine the most accurate and efficient blends of methodology.

Internal proficiency testing has proven to be invaluable for assessing procedures, determining staff skills and educational upgrading requirements and the overall performance of the laboratory.

Internal proficiency testing in the Clinical Microbiology Laboratory has recently been modified to provide better communication between this section and the laboratory and recommendations are being implemented to sharpen identification skills.

Microbiology proficiency testing in Laxus is also in the process of being reorganized. Specimens will be submitted more frequently and new forms will be designed to provide unit by unit analysis and uniformity in reporting. The new procedures will, it is hoped, increase communications between the units being tested and the C.P.L. The Gram Stain program to Laxus will also be stepped up to increase the number of submissions thus enabling the Quality Control Section to better assess the quality of staining and microscopic interpretation.

With the assistance of the Environmental Virology Laboratory, an increased number of specimens for proficiency testing in the Virus Isolation Laboratory have been submitted. Preparation of these specimens is tedious and time consuming but well worth the effort in that a more effective evaluation is available. As soon as it is feasible, the section would like to maintain virus stock cultures for use in this program.

A number of studies were undertaken to assess various media and modifications to media recipes resulting directly in some procedural changes. These reports were:

Technical Support Services (Cont.)

1. Evaluation of Amies with Charcoal Transport Media
2. Modifications to Modified Tinsdale Media
3. Evaluation of Cystine Tellurite Media
4. Survival of C. diphtheriae in Amies Transport Media
5. Preliminary Quality Control on CCFA & DYS media
6. Problems Encountered with F-G Agar & GVP

Media Section

This section prepares routine and specialized media, stains and reagents for C.P.L. and Laxus and transport media to users of our laboratory services. New formulations and modifications to existing recipes are prepared on request.

New formulations included:

1. CCFA for selective isolation of Clostridium difficile
2. TCCFA for selective isolation of Clostridium difficile
3. GVP agar for isolation of Legionnella pneumophila
4. PPLO agar to detect cell wall defective forms
5. Pappenheim Stain for easier differentiation when used as a counter stain in Gram Stain procedure.
6. Huckers Modification of Crystal Violet for better differentiation in Gram Stain procedure.
7. BMPA for isolation of Legionnella pneumophila
8. DYS agar for isolation of Yersinia enterocalitica from stool cultures.
9. Rapid Microbiochemical solutions for identification of Gardnerella vaginalis.

In an effort to meet increasing demands for media, another New Brunswick MP320 plate pouring machine has been purchased. Many mechanical problems exist with the AS-3, a three-litre agar sterilizer.

The section is now also supplying media to Churchill and Beausejour and Thayer Martin plates to Leaf Rapids and Swan River.

Investigations are ongoing into the problems with contamination of blood agar plates. Product pretesting of agar is used to ensure that the most reliable product available is purchased. Sterilization procedures have been modified and increased. Indications are that a combination of factors, including water quality, contribute to the problems encountered.

Technical Support Services (Cont.)

A media operations manual was compiled and completed which outlines in detail all procedures followed for continuous and harmonious operation of this section.

Washup/Sterilization

Cooperation with the various departments in the Cadham Provincial Laboratory is the key to the successful operation of this section.

Problems have been encountered with the quality of the R.O. water and has resulted in procedural changes as required.

A washup/sterilization manual has been developed that outlines in detail all procedures followed in this section.

SEROLOGY

The report on activities in the Serology section will be presented under 2 headings, A) Highlights of Results, and B) Evaluation of Kits.

A. Highlights of Results

Interesting results obtained during the year can be summarized as follows:

1. During the winter of 1982 - 1983 Mycoplasma pneumonia caused many of the respiratory infections throughout Manitoba and in all age groups. An outbreak of Influenza A/ Bangkok was diagnosed both by virus isolation and serology. Towards the end of the winter, 1 case of Influenza B was identified. Numerous Respiratory Syncytial Virus infections occurred, mainly in young children and in the older age group.

2. Hepatitis testing continued to increase. An outbreak of Hepatitis A in a school in Winnipeg and an outbreak of Hepatitis B in a federal penitentiary were confirmed serologically. "High risk" groups were tested for Hepatitis B markers to identify those individuals likely to receive the newly released Heptavax vaccine. Both Hepatitis A and B were found to be more prevalent in selected inner-city populations.

3. Manitoba is experiencing an outbreak of rubella, however no cases of congenital rubella have been confirmed. Most of the recent rubella infections were in males.

4. Due to concern about transmission of a Rickettsial infection (Q fever) from sheep to man, all sheep used at the Medical College for various studies are routinely tested for Q fever. To date all sheep seem free of this infection. The CPL has an arrangement with the Provincial Veterinary Laboratory whereby we perform for them some of the low volume serological testing; this arrangement is based on the expertise found at the CPL specifically in serologically testing for Chlamydia, Toxoplasma, Q fever, Influenza.

5. The detection of specific IgM antibodies has improved the diagnosis of Infectious Mononucleosis. In 1982, the spot tests for Heterophile antibodies were negative in 17 patients who had IgM antibodies specific to the EBV, Viral Capsid Antigen. The spot test became positive 6 days later in one patient who was serially tested.

6. An outbreak of Pertussis was reported in Portage la Prairie; one 7 year old male had a rise in antibody titre from 1:8 to 1:512; the other children were diagnosed on the basis of clinical picture and high antibody titres.

SEROLOGY (CONT.)

7. The following rarer infections were diagnosed:

   a. Brucella melitensis in a 52 year old veterinarian.

   b. Rocky Mountain Spotted Fever in a 42 year old male.

   c. Both Pseudomonas pseudomellei and Aspergillus fumigatus in a 28 year old male Indochinese.

   d. Cryptococcus neoformans in 2 males.

   e. Leptospira canicola in a 35 year old female.

   f. Q fever in a 74 year old female.

   g. One case of Trichinosis.

   h. One case of Hydatid disease in a 30 year old female (died).

   i. One case of Dirofilaria spp. (histopathological and serological diagnosis).

   j. One case of Dengue fever acquired in India.

8. Three cases of Chlamydia-Psittacosis were diagnosed on the basis of the presence of specific IgM antibodies; two of these cases were babies, one male, one female. The third case was a pet shop employee.

9. Seven cases of Legionnaire's Disease were diagnosed based on fourfold change in antibody titres. All these were sporadic infections.

10. Twelve cases of Toxoplasmosis were diagnosed in persons with specific IgM antibodies. On several of these, the serological results matched the histopathological reports on lymph node biopsies.

11. Two cases of Salmonella typhi resulted in a public health investigation. A total of 42 person were tested in March using the Widal test, which was found to be useful in this epidemiological study.

B. Evaluation of Commercial Kits/Reagents

During the year a number of commercially produced kits were investigated with the purpose of: (i) speeding up the diagnosis by relying on the detection of IgM antibodies in single sera; (ii) improving the sensitivity and specificity of tesı done routinely in the laboratory. A summary of these evaluations is as follows.

I Evaluation of kits for the serodiagnosis of rubella

1. An ELISA test for the detection of specific IgM antibodies (Abbott Laboratories) compared favourably with the sucrose gradient method. It may be more

sensitive than the latter; it is definitely less time-consuming since it does not require ultracentrifugation, thus allowing results to be ready the same day.

2. ELISA tests for the detection of specific IgG antibodies; two products were evaluated, one produced by Ortho Diagnostics and the other by Abbott Laboratories. Both were found to give comparable results to the tests in current use at the CPL (i.e., PHA and HI); however, both are more costly and much more laborious to perform.

3. A PHA test for the detection of specific IgG antibodies (Abbott Laboratories) was evaluated. Rubacell II is a newer, more specific, and easier to read test than the current PHA test used at the CPL (Rubacell I). Rubacell II does not require an unsensitized RBC cell control; however, the low dilutions used for this test may give false positive results.

4. An agglutination test for the detection of specific IgG was evaluated, i.e.; Rubascan (Hynson, Westcott and Dunning). This test is similar to the RPR used to screen for syphilis. Rubascan compared well with Rubacell I (PHA test) when undiluted sera was tested; however, making the required 1:10 serum dilution was time-consuming and results were difficult to read, especially in the sera having some borderline agglutination. Rubascan is more costly than Rubacell and therefore, presents no advantages over the PHA.

II Evaluation of kits for the serodiagnosis of Cytomegalovirus

1. A kit for the detection of specific IgM antibodies using an ELISA procedure was found to be unsatisfactory.

2. The test for the detection of specific IgM was evaluated using the FIAX system. Sera were tested in duplicates, comparing the FIAX results with those of the Complement Fixation test (CF) in current use at the CPL. There was a 94% agreement between the 2 tests (47 out of 50 sera tested), the FIAX testing is simple to perform, not requiring a trained technologist. FIAX has the following disadvantages:

   a. It costs approximately 6 times more than the CF.

   b. The high and low CF titres did not always correlate with the corresponding fluorescent values.

   c. The manufacturer's positive control serum gave a low fluorescent reading, which was found unacceptable.

SEROLOGY (CONT.)

III Evaluation of tests for Syphilis

Fisher's Screen test for syphilis (RST) was found to have no advantage over the RPR test currently used at the CPL (Hynson, Westcott and Dunning). Reading the test was difficult because of placing 15 sera on the same card, it was particularily difficult to read weakly reactive results due to the lower concentration of the antigen suspension.

IV Evaluation of kits for Rheumatoid Factor (RF)

Two kits were compared: one manufactured by Ortho Diagnostics, the other by Behring. Very little difference was found between the 2 kits. The Ortho kit was 2 to 4-fold more sensitive on quantitation and test can be read after 1 minute. Behring test is read after 5 minutes.

V Evaluation of tests for Anti Nuclear Factor (ANF)

The FIAX test was evaluated in collaboration with Dr. Paraskevas. The test is rapid, does not require a trained technologist and will be introduced at the CPL for screening purposes.

SEROLOGY
April 1, 1982 - March 31, 1983
With Comparison to 1981 - 1982

	1981 - 1982		1982 - 1983	
	No. of Tests	Number Reactive	No. of Tests	Number Reactive
I. Bacterial				
Syphilis				
Blood	97,702	1,390	86,744	2,411
CSF	Included in blood		813	0
DFA	172	1	74	0
Total Syphilis	97,874	1,391	87,631	2,411
	No. of Tests	No. with Elevated Titre	No. of Tests	No. with Elevated Titre
Streptococcal Antibody				
ASOT	3,197	201	3,325	351
Anti DNase B	3,102	1,285	2,843	501
CRP	573	118	1,593	113
Vi	50	1	141	8
Brucella abortus	493	41	532	35
Pasteurella tularensis	23	2	0	0
II. Miscellaneous				
Rheumatoid factor	2,380	195	2,420	747
Thyroid	357	61	416	22
Toxoplasmosis	11,137	1,874	--	--
Legionnaires'	749	50	948	96
	Number Tested	Number Positive	Number Tested	Number Positive
Mumps	334	2	424	2
Measles	558	3	930	7
Rotavirus	181	2	357	8
Lymphochoriomeningitis	18	—	46	—

SEROLOGY
April 1, 1982 - March 31, 1983
With Comparison to 1981-1982

	1981/82		1982/83	
III. ARBOVIRUS	No. Tested	No. Positive	No. Tested	No. Positive
Surveillance:				
Chicken (WEE)	344	63	1,175	0
Other (WEE)	21	77	4	10
Human (WEE)	250	21	277	25
Mosquito Pools	728	35	822	1 (Hart Park Flanders)
Diagnostic:				
Humans (WEE, SLE, CE)	586	25	231	1 (SLE)
Horses (WEE)	183	120	13	1

	1981/82				1982/83			
IV. RUBELLA	No. Tested	No. Susceptible	No. Recent Infections	IGM	No. Tested	No. Susceptible	No. Recent Infections	IGM
Surveillance:								
Prenatals Premaritals Females-child bearing age	37,792	3,915	N.A.	N.A.	37,964	2,920	N.A.	N.A.
Diagnostic:								
Prenatals Newborns Children Adults	2,638	608	28	8	4,403	980	117	36

Serology (Cont.)

	1981 - 1982		1982 - 1983	
	Number Tested	Number Positive	Number Tested	Number Positive
V. Hepatitis				
HBsAg	9,283	451	10,005	534
Anti HB core	3,966	772	2,938	674
Anti HB surface	6,290	654	2,506	573
HBe antigen	556	148	541	129
Anti HBe	555	145	538	128
RPHA	868		1,220	
IgM HAV	1,517	99	2,338	352
IgG HAV	2,149	522	940	320
VI. Herpes Group				
H. simplex	2,272	48	2,927	59
H. zoster	1,505	19	1,887	21
CMV	2,740	21	3,272	25
EBV - spot	1,432	84	2,794	71
IgM) VCA	910	19	1,735)	79
IgG) VCA	459		78)	
VII. Respiratory				
Adeno	7,364	43	7,492	25
RSV	6,960	17	7,233	46
Parainfluenza 1	6,941	10	7,233	9
Parainfluenza 2	6,941	3	7,205	1
Parainfluenza 3	7,136	30	7,245	22
Flu A	7,103	26	7,355	81
Flu B	6,965	2	7,280	44
VIII. Mycoplasma				
CF	7,514	34	7,572	137
Cold Agglutinins	430	14	594	49
IX. Rickettsia				
Psittacosis) Chlamydia) Lymphogranuloma venerum	601	1	1,004	3
Q fever	199	—	250	2
RMSF	71	—	114	2

Parasitology Isolates
April 1, 1982 - March 31, 1983
With Comparison to 1981 - 1982

	Number Isolated	
	1981/82	1982/83
Protozoa - pathogenic		
Dientamoeba fragilis	55	31
Entamoeba histolytica	156	105
Giardia lamblia	368	403
Plasmodium vivax	20	11
Non-pathogenic		
Trichomonas vaginalis	3	0
Blastocystis hominis	587	575
Chilomastix mesnili	33	39
Entamoeba coli	477	451
Entamoeba hartmanni	142	88
Endolimax nana	342	305
Iodamoeba butschlii	28	26
Trichomonas spp.	0	0
Trematodes		
Chlonorchis/Metagonimus/Heterophyes/ Opisthorchis	15	18
Fasciola/Fasciolopsis	1	0
Metorchis conjunctus	47	0
Schistosoma spp.	7	1
Cestodes		
Diphyllobothrium latum: ova	10	34
segments	1	9
Hymenolepis diminuta	8	0
Hymenolepis nana	6	8
Taenia spp.: ova	2	4
segments	1	2
Nematodes		
Ascaris lumbricoides: ova	81	40
adults	19	8
Capillaria spp.	0	0
Enterobius vermicularis: ova	13	8
adults	4	0
Hookworm spp.	142	106
Strongyloides stercoralis	16	12
Trichostrongylus	6	4
Trichuris trichiura	272	151
Arthropods	1	4
louse	3	1
nit	4	3
mites	0	1
ticks	4	1
Gordiacea	1	0

ENVIRONMENTAL MICROBIOLOGY

The highlights of the 1982 - 1983 year are as follows:

1. In collaboration with the town of Roblin, the Department of Agriculture of the University of Manitoba and the provincial and federal governments, the Cadham Provincial Laboratory conducted a study of the microbiological aspects of spray irrigation of sewage effluent on agricultural land. Preliminary results indicated that this method of sewage disposal may be beneficial to farmers, as well as presenting only a minimal risk to health.

2. In collaboration with the City of Winnipeg, which was investigating a new method for sludge disposal, the CPL examined soil samples collected from the sites injected with sewage sludge in 1981; no pathogens were detected in the soil one year in post-sub-surface injections of raw and disgested sludges.

3. The CPL was requested to examine soil samples from an archeological dig at Lower Fort Garry where remarkably-preserved human waste along with other artifacts were discovered. Samples were examined for disease-producing bacteria, parasites and viruses. None were cultured or identified; however several particles resembling enteroviruses were seen by electron microscopy.

4. In response to requests for the detection of Hepatitis A viruses in water, a method was set up; large volumes of water were concentrated and the concentrate tested with the procedures and reagents used for the serodiagnosis of this viral infection.

5. The detection of viruses in environmental samples is complex and developmental work was continued in order to improve the yield. For example, Immunoelectron microscopy was introduced in the laboratory; newer methods for concentrating viruses were evaluated, such as isoelectric casein, electropositive filters; methods for removal of toxic substances (from sewage) were compared, and a concentration of 17% skim milk was found to double the yield of viruses.

6. A comparison of methods for testing turbid waters was undertaken to determine the accuracy of certain methods. Membrane Filtration (MF) and Most Probably Number (MPN) were compared using both the abbreviated and modified MPN methods, So far the results did not show any difference.

7. Tests for fecal streptococci are now performed routinely on all surface waters since this test has recently been reported to a better marker of pollution than the traditional fecal coliforms.

8. All public whirlpools throughout the Province were tested for Psuedomonas during the summer; the yield indicated that tests for Pseudomonas should be performed routinely.

9. Whenever tests for Legionella spp are requested on humidifier and air-conditioner waters, these samples are now routinely examined for thermophilic fungi as well.

10. Requests for the microbiological testing of foods increased considerably during the last year.

    a. Several "bulk foods" sold at retail stores were investigated to determine whether disease-producing organisms could grow in them. Seeding experiments indicated that peanut butter, jellies, jams, marmalades would not support the growth of pathogens.

    b. Bean sprouts sold through various outlets were also investigated. High numbers of bacteria were detected.

    c. The ice cream product monitoring program in Winnipeg was expanded to include suburban Winnipeg. The Inner City program now includes tests done on automatic machines used to whip the cream.

    d. The CPL has been requested to test samples of milk taken from airplanes entering Winnipeg from foreign points.

    e. A number of food poisoning outbreaks were investigated during the year.

        i A common source outbreak involving 35 persons was traced to a potato salad served in a hotel in the City of Winnipeg.

        ii Repeated complaints were received on a restaurant in downtown Winnipeg. Weekly sampling of their food showed repeated high bacterial counts; an investigation showed that the food was cooked in advance. Since they started serving freshly cooked food only, no complaints were received.

        iii The investigation of an outbreak of food poisoning in the armed forces in Portage la Prairie failed to determine the source of infection.

        iv An outbreak of food poisoning in a senior citizen's home in Portage la Prairie was found to be caused by Bacillus cereus.

        v A Salmonella New Brunswick was isolated from home-smoked fish.

ENVIRONMENTAL MICROBIOLOGY (CONT.)

vi A Salmonella typhimurium was isolated from a pork sample obtained from a Chinese dim-sum.

11. All foods suspected of causing Staphylococcal food poisoning are now checked for enterotoxin.

12. Air Microbiology testing was performed to determine the type of bacteria found and the extent of aerosolization in a spray irrigation project using sewage effluent. Results indicate that Gram Negative bacteria are found in the air following spraying.

13. Mosquitoes were tested for the presence of arboviruses as part of the summer arboviral surveillance program. No Western Equine Encephalitis virus was isolated in 1982.

Environmental Microbiology
April 1, 1982 - March 31, 1983
with Comparison to 1981 - 1982

Category	1981 - 1982		1982 - 1983	
	Specimens	Tests	Specimens	Tests
A. Routine				
Water	37,902	70,787	40,027	72,293
Swab rinse	223	446	252	504
Food	2,390	5,234	2,781	7,054
Total	40,515	76,467	43,887	79,851
B. Special Projects				
Viruses in Water/ Wastewater	501	501	300	300
Pathogenic Bacteria in Water	1,088	1,781	1,513	1,562
R & D	--	--	618	1,827
Total	1,589	2,282	2,431	3,689

METABOLIC DISEASES & CHEMISTRY

During the period April 1, 1982 through March 31, 1983, the newborn screening program uncovered eleven significant findings; 10 in babies and 1 adult. These were:

- 2 hyperphenylalanine (1 baby, 1 adult)
- 4 congenital hypothyroidism
- 3 cystinuria
- 2 Hartnup Disease

This section, in cooperation with the Dept. of Biochemistry at the Children's Hospital, has been working on a technique to quantitate galactose and galactose-1-phosphate from blood specimens collected on filter paper and employing the Multistat III analyzer.

Technical Subcommittees in diseases of metabolism and endocrinology were established to deal with specific problems and make recommendations to the Provincial Perinatal Screening Committee. One recommendation that was forthcoming and adopted was to stop the routine quantitative determination of tyrosine by flurometric analysis in newborns.

The Cholinesterase Screening Program for workers engaged in the use of organophosphate insecticides was expanded to encompass rural Manitoba. During the summer season, 125 applicators were sampled and 816 tests were performed. Four individuals with genetically-based low values were detected as well as one individual whose values declined to below the normal range from an initial normal base-line value. Depending on staffing and budget, consideration is being given to offer cholinesterase testing to those engaged in handling organophosphate compounds on a year-around basis.

In July 1982 the C.P.L.'s back up support of diagnostic chemistry in LAXUS units was upgraded when selected reference chemistries went on stream at the C.P.L. These specimens will no longer have to travel half way across the province for analysis and with the reporting mechanism by TWX or phone, turn around time has been drastically reduced. By year end, thyroid function, lipoprotein fractions, iron & TIBC, B_{12} and folates were either on or about to be on stream.

METABOLIC DISEASES & CHEMISTRY (CONT.)

	1981/82	1982/83	Total Positive Findings, 1965, to 31 Mar./83 Inclusive
P.K.U.	1	2 (1 adult)	14
Galactosemia	-	-	2
Prolinemia	-	-	3
Histidinemia	3	-	9
Maple Syrup Urine Disease	-	-	1
Tyrosinemia	1	-	1
Hypothyroidism	-	4	14
Transient hypothyroidism	-	-	2
Linqual thyroid	-	-	1
Cystinuria	-	3	4
Glycinemia	1	-	1
Hartnup Disease	1	2	3
	7	11	55

LABORATORY AND X-RAY UNITS SYSTEM

The Laboratory and X-ray Unit System (Laxus) continued to provide diagnostic services in laboratory, radiology, and electrocardiography departments in 70 facilities in rural and northern Manitoba. For the first time in Laxus' history, diagnostic ultrasound services were made available. Three ultrasound departments were opened in October/ November, 1982, in Dauphin, The Pas, and Winkler, and a visitation service was initiated in Swan River in December, 1982. The Churchill Health Centre signed a Memorandum of Agreement with Laxus, and the Manitoba Health Services Commission, on July 1, 1982.

Rural Lab & X-Ray Units - - APRIL 1st, 1982, TO MARCH 31st, 1983

UNIT	LAB. S.C. UNITS TOTAL	IN/PAT.	O/PAT.	X-RAY EXAMINATIONS TOTAL	IN/PAT.	O/PAT.	E.C.G.'s TOTAL	IN/PAT.	O/PAT.
RUSSELL	206,179	97,266	108,913	3,284	945	2,339	970	465	505
BIRTLE	218,842	61,130	157,712	1,999	315	1,684	958	336	622
ROSSBURN	77,815	27,092	50,723	673	171	502	304	128	176
SHOAL LAKE	138,509	50,816	87,693	1,336	351	985	452	239	213
DAUPHIN	1,244,269	460,054	784,215	17,951	4,850	13,101	6,611	2,199	4,412
ROBLIN	243,982	115,302	128,680	2,770	721	2,049	672	370	302
GILBERT PLAINS	75,371	17,089	58,282	910	100	810	310	53	257
GRANDVIEW	106,151	35,536	70,615	1,449	288	1,161	377	125	252
STE. ROSE	318,370	211,044	107,326	5,327	1,747	3,580	1,300	715	585
WINNIPEGOSIS	115,351	68,893	46,458	1,286	504	782	495	311	184
McCREARY	94,155	38,424	55,731	1,250	303	947	570	243	327
NEEPAWA	485,736	169,429	316,307	5,149	1,014	4,135	1,479	560	919
ERICKSON	67,414	32,692	34,722	651	189	462	189	74	115
GLADSTONE	206,860	60,934	145,926	2,328	498	1,830	533	208	325
MINNEDOSA	201,752	92,983	108,769	3,583	849	2,734	931	382	549
CARBERRY	187,687	65,834	121,853	2,068	454	1,614	752	249	503
PORTAGE	959,648	316,720	642,928	12,660	2,888	9,772	3,363	1,177	2,186
MacGREGOR	35,544	22,161	13,383	470	119	351	257	85	172
MANITOBA SCHOOL	66,857	-	66,857	1,216	1,147	69	57	-	57
NOTRE DAME	53,964	11,733	41,961	461	115	346	122	56	66
ST. CLAUDE	53,737	27,130	26,607	632	208	424	250	112	138
TREHERNE	140,123	53,937	86,186	1,610	266	1,344	332	153	179
KILLARNEY	334,526	112,645	221,881	4,857	949	3,908	805	292	513
BALDUR	49,001	21,503	27,498	533	147	386	164	95	69
BOISSEVAIN	160,869	51,598	109,271	2,268	455	1,813	743	283	460
CARTWRIGHT	5,528	1,343	4,185	94	13	81	11	-	11
CRYSTAL CITY	185,502	66,483	119,019	2,204	493	1,711	695	341	354
DELORAINE	171,804	65,540	106,264	2,556	367	2,189	678	258	420
MELITA	167,996	61,734	106,262	2,354	413	1,941	656	294	362
PILOT MOUND	-	-	-	-	-	-	-	-	-
MORDEN	585,098	233,695	351,403	5,281	1,775	3,506	1,263	748	515
ALTONA	199,222	68,941	130,281	2,853	576	2,277	513	205	308
CARMAN	267,216	121,542	145,674	4,034	1,417	2,617	689	391	298
EMERSON	76,376	27,197	49,179	714	172	542	265	52	213
MANITOU	56,784	17,503	39,281	465	100	365	339	117	222
MORRIS	361,208	122,270	238,938	3,023	594	2,429	1,295	543	752
SWAN LAKE	379,591	97,605	281,986	3,661	559	3,102	1,130	283	847
WINKLER	348,729	199,399	149,330	4,959	1,824	3,135	962	712	250
SELKIRK	361,549	175,816	185,733	11,078	1,712	9,366	2,370	1,382	988
BEAUSEJOUR	177,402	121,113	56,289	3,870	744	3,126	593	451	142
SELKIRK M.H.C.	326,972	97,340	229,632	1,116	1,116	-	442	442	-
PINAWA	143,889	53,764	90,125	1,503	369	1,134	389	262	127
PINE FALLS	275,611	126,006	149,605	2,990	775	2,215	921	392	529
WHITEMOUTH	32,103	17,806	14,297	602	283	319	218	109	109
LAC DU BONNET	70,241	-	70,241	1,044	-	1,044	211	-	211
SWAN RIVER	677,766	301,750	376,016	8,962	2,044	6,918	2,390	911	1,479
BENITO	39,339	10,360	28,979	147	37	110	278	50	228
GIMLI	293,896	73,787	220,109	4,004	585	3,419	1,005	389	616
STONEWALL	237,376	72,112	165,264	3,204	562	2,642	824	205	619
ERIKSDALE	58,344	14,546	43,798	1,039	103	936	166	84	82
TEULON	275,840	96,382	179,458	3,819	759	3,060	769	336	433
VIRDEN	302,784	93,568	209,216	3,815	668	3,147	1,262	427	835
HAMIOTA	324,441	113,603	210,838	2,931	582	2,349	1,367	466	901
RESTON	74,918	25,915	49,003	884	215	669	370	133	237
SOURIS	397,557	165,099	232,458	4,815	1,220	3,595	1,439	507	932
RIVERS	146,954	34,562	112,392	1,253	188	1,065	514	106	408
HARTNEY	-	-	-	-	-	-	-	-	-
BRANDON M.H.C.	-	-	-	1,544	1,117	427	-	-	-
ASHERN	113,957	29,668	84,289	1,294	188	1,106	438	103	335
ARBORG	126,422	68,996	57,426	2,068	394	1,674	342	248	94
CHURCHILL	590,679	227,482	363,197	2,506	755	1,751	278	135	143
FLIN FLON	1,019,667	481,226	538,441	13,544	3,495	10,049	4,059	1,529	2,530
GILLAM	60,122	15,747	44,375	529	92	437	55	26	29
GLENBORO	45,092	13,158	31,934	736	158	578	243	100	143
LEAF RAPIDS	69,120	7,321	61,799	715	52	663	78	5	73
LYNN LAKE	125,172	55,017	70,155	1,632	415	1,217	599	287	312
ST. PIERRE	164,531	78,644	85,887	3,853	871	2,982	665	357	308
STE. ANNE	94,037	36,987	57,050	3,172	273	2,899	311	156	155
SNOW LAKE	47,612	3,142	44,470	508	11	497	119	11	108
STEINBACH	572,560	280,947	291,613	7,881	1,935	5,946	2,144	1,099	1,045
THE PAS	1,263,848	657,559	606,289	16,766	4,235	12,531	2,262	1,179	1,083
VITA	31,445	12,895	18,550	462	86	376	140	62	78

TOTAL S.C. UNITS = 17,188,742 IN/PAT - 6,867,515 OUT/PAT - 10,321,227
TOTAL X-RAY EXAMINATIONS = 223,205 IN/PAT - 53,935 OUT/PAT - 169,270
TOTAL E.C.G.'S = 58,753 IN/PAT - 24,803 OUT/PAT - 33,950

Laboratory - Eastern Region

New Programs

- Institution of a Blood Gas Analysis diagnostic service at the Carman Laboratory and X-ray Unit.
- Institution of on-site partial microbiology service at the St. Pierre Laboratory and X-ray Unit which includes the local processing of throat swabs and associated quality control protocol.
- Introduction and institution of a semi-automated bio-chemistry analyzer system - Gilford System 103 with associated auto pipetor dilutor at Portage la Prairie Laboratory and X-ray Unit.
- Institution of serum and urine electrolyte analysis at the Eriksdale Laboratory and X-ray Unit.
- The co-ordination and institution of the use of Amies media with charcoal for the transport of microbiology specimens to Reference Laboratories. The local production of Jembec Plates (Thayer Martin culture media to continue at the Selkirk Laboratory and X-ray unitl current consumables are exhausted.
- Instituting the conversion from the conventional reporting units to the System Internationale (S.I.) system of Laboratory reporting.
- Institution of an on-site partial microbiology service at the Beausejour Laboratory and X-ray Unit.
- Laboratory Program and Equipment audits performed at Churchill and Thompson.
- The extension of Diagnostic services by additional one-half day service per week to each of Notre Dame and MacGregor.
- The institution of a Diagnostic Service at Riverton via an extension service from the Gimli Laboratory and X-ray Unit.
- The expansion of the Level II microbiology service at the Morden Laboratory and X-ray Unit to include the referral from additional surrounding Units.
- The institution of Electronic Blood Cell Counting apparatus at Treherne, Ste. Anne, St. Pierre and Eriksdale Laboratory and X-ray Units.

Upgrading Programs

- Electrolyte analyzer equipment upgraded at Churchill, Morden, Winkler, Steinbach and Eriksdale.
- Chemistry program upgraded at the Portage Laboratory and X-ray Unit with the introduction of the Gilford System 103.
- Spectrophotometry - new Gilford Stasar II spectrophotometers complete with mechanical flow-through cuvette capabilities installed at Churchill, Steinbach, Ste. Anne, St. Pierre, Treherne, and Stonewall Laboratory and X-ray Units.
- Electronic cell counters (Hematology) Sysmex TOA CC-110 instrumentation with WBC, RBC and Hemoglobin capabilities installed at Ashern, Ste. Anne, St. Pierre, Pinawa, Carman, Treherne and Eriksdale Laboratory and X-ray Units.
- The revision of all the Laboratory Report Forms and Requisitions to coincide with the System Internationale (S.I.) measurements units.

Laboratory - Eastern Region (Cont.)

- Centrifugation - new induction type centrifuges installed at Stonewall, Churchill, Steinbach and Morden Units.
- Laboratory Procedures Manual revised and updated to the System Internationale system and revisions to the microbiology section.
- Fume Exhaust Hood - installation at the Stonewall Laboratory and X-ray Unit.
- Microscopy - upgrading of microscope equipment at Churchill.
- Refrigeration - upgrading and expansion of refrigeration capabilities at Churchill and Beausejour.
- Electronic cell counter (Hematology) Sysmex TOA CC - 120 analyzer with WBC, RBC, Hemoglobin, Hematocrit and mean corpuscular volume capabilities installed at the Gimli Laboratory and X-ray Unit.
- The installation of semi-automated (Technomat) Petri dish fillers for the preparation of microbiology culture plates, installed at Morden, Portage and Churchill Laboratory and X-ray Units.
- Table Top CO_2 microbiology incubator installed at Portage Lab and X-ray Unit.
- Incubation (microbiology) and coagulation analyzer equipment installed at Churchill.
- Institution of the Ames Multistix S.G. for the biochemical analysis of urine specimens.

Quality Control Programs

The Division continues to monitor and ensure quality of Laboratory analysis by participating in the following internal and external Quality Assurance programs:

- The College of American Pathologists Quality Assurance Program, both basic and XL series.
- Ames Urinalysis program.
- The internal Divisional Hematology Q.C. program.
- The Hyland Scan computerized chemistry control program.
- Commercial Hematology Control Cells (internal program) on all electronic cell counting apparatus.
- Microbiology - a comprehensive gram staining, sensitivity testing and culture identification Q.C. program co-ordinated for the participating Laboratory and X-ray Units by the Quality Control Section of the Cadham Provincial Laboratory.

Research and Development

- The Ames Seralyzer (chemistry) evaluated with the Division by the Chemistry Section of the Cadham Provincial Laboratory.
- Gilford System 103 Chemistry Analyzer evaluated and subsequently purchased (Portage Laboratory and X-ray Unit).
- The Instrumentation Laboratory (IL Model 501) Ion Selective Electrolyte analyzer system evaluated at the Steinbach Laboratory.
- The Corning Chemlyte Ion Selective Electrode Electrolyte System evaluated.

Laboratory - Eastern Region (Cont.)

- The Corning Model 480 Flame Photometer evaluated on location at Fisher Scientific.
- Beckman blood gas control materials evaluated at the Portage Laboratory.
- The Fisher Diagnostics Hematology Blood Cell counting diluents, lysing agents and hemoglobin blanking and reference solutions and reagents evaluated at the Morden Laboratory.
- A re-evaluation of all the commercial sources of the Urine Dip slide used in urine microbiological testing under the aegis of the Cadham Provincial Laboratory.
- An evaluation of the various sources and quality of microscope slides.
- The evaluation of a new commercial source of an internal chemistry Q.C. program.
- The search of a suitable source of substrates and calibration standards for Triglyceride and cholesterol analysis compatable with Electronecleonics instrumentation.

Construction and/or Renovations

- Renovations/construction completed at Ste. Anne, Beausejour and Carman.
- Renovations/construction currently in progress at Selkirk, Arborg.
- Renovations/construction at the Functional Program stage at Pine Falls and Steinbach.

Objectives 1983/84

- Decentralization of transport media production to one, or, if necessary, two locations.
- Exploration of further decentralization of microbiology services.
- Investigation of existing Laboratory services in various locations with the view of further expansion or deletion of certain testing programs.
- Continued upgrading of diagnostic instrumentation.
- Continued assessment and evaluation of state-of-the-art methodology and equipment.

Laboratory - Western Region

New Programs

- Theophyline Analysis - Flin Flon, The Pas
- Chemistry Analyzer - Neepawa
- Electrolyte Analyzers - Snow Lake, Rossburn, Melita, Crystal City
- Hematology Analyzers - Lynn Lake, Shoal Lake, Carberry, Melita, Grandview
- Microbiology Media Pouring - Dauphin, The Pas

Upgrading Programs

- Hematology - The Pas, Gladstone, Crystal City, Virden, Souris
- Chemistry - Dauphin: Automated Analyzer
  Neepawa: Semi-Automated Analyzer
  The Pas, Minnedosa, Souris and Virden - Spectrophotometers
- Microbiology - Virden, Roblin, Dauphin, The Pas
- Blood Bank - Flin Flon
- Coagulation - Flin Flon, The Pas, Swan River, Killarney
- Electrolyte Analyzers - Lynn Lake, Flin Flon, The Pas, Birtle, Minnedosa, Neepawa, Souris

Product Evaluation (Research and Development) Reagent Systems

- SGOT, Bilirubin, Urine dip sticks, Pregnancy test, various aqueous and serum based standards, liquid control serums, coagulation reagents

Instrumentation

- Chemistry, Hematology - Elctrolyte Analyzers

Radiology: Western Region

Equipment Updates

Birtle - a new Xonics model XMS 350 150 kVp 300 Ma X-ray Generator was installed and integrated with existing General Electric equipment. This addition brings the latest in x-ray exposure control technology with errorless microprocessor timer control.

Swan River - a linear tomography unit was purchased for integration with the existing General Electric x-ray suite. This addition allows more intensive diagnostic investigations.

Melita - one of the first two low-volume Pako 14 XL x-ray film processors for Lab and X-ray Services was installed. It features low chemistry and power consumption. Its performance and function will be studied for application in other moderate-low volume departments.

Killarney - a complete new radiography fluoroscopy suite was purchased later in the 82/83 fiscal year with installation expected to be in May, 1983.

The instrument is a 150 kVp, 300 Ma generator, 4 way float top, monitrol table, 6" image intensification with coaxial video, closed circuit television, ceiling suspended x-ray tube crane, automatic exposure control and automatic collination.

Statistics Canada Workload Measurement System for Diagnostic Radiology

For years x-ray departments have been trying to devise a more meaningful and accurate method of accessing the total department workload than simply counting the number of varied examinations performed.

Although at very short notice, Stats Canada introduced in March 1982 a new workload measurement system for implementation on April 1, 1982. This system is similar to that used for a number of years in laboratories where each unit equals 1 minute of work. The result of several years of time studies in a variety of hospitals is a unit value system that can be applied to each type of technical examination as well as support functions and patient transportation.

This required a complete revision of our monthly statistical reporting system. Examination categories had to be redefined, Stats Can. instructions interpreted report forms altered and technologists briefed.

A preliminary format was immediately established to meet the deadline. Over the past year, several report form revisions had to be adopted as a result of feedback from the staff.

As with any new system, a number of refinements are still necessary and will be forthcoming.

Intensifying Screens (Rare Earth)

After exhaustive research, technical testing and a clinical evaluation, the new Rare Earth technology for radiography imaging screens was finally introduced into Lab and X-ray Services in the fall of 1982 and the initial stage of conversion completed in January, 1983.

Rare Earth is a collective name given to a series of elements that were found to be very effective light-emitting phosphors when exposed to x-rays. Phosphors are a vital link in the imaging chain in that by their acting penetrating x-rays are converted to light which produces the end result, the film image. Using gadolinium oxysulfide screens that provide the maximum x-ray absorption and light output x-ray departments were converted to rare earth in Killarney, Souris, Neepawa, Dauphin, The Pas, and Flin Flon. The department conversions went very smoothly, there being none of the major problems with kVp and phototiming sensitivities and adjustments that had been anticipated.

The main promotion of the rare earth screens proved to be accurate in the clinical setting; exposure factors and dose were reduced to 50% of what had been used prior to the conversion in the two departments tested after conversion.

Electrocardiography

Cambridge CM3000 3-channel instruments have been purchased for Swan River and a Marquette Mac I which was donated to the hospital is being used by the EKG department at Dauphin.

Four single-channel Cambridge Vs-550 microprocessor controls similar to that incorporated in the three channel mentioned above were purchased for Hamiota, Ste. Rose, Killarney and Souris. Last year the first one that was purchased by Lab and X-ray Services was assessed at The Pas. The microprocessor components for self-testing and self-calibrating and the signal stability and ease for operator use of the equipment proved to be very satisfactory.

New and Renovated Departments

Glenboro - Hospital construction reached the stage in March, 1983 that required the x-ray department to be closed for six weeks for renovations and linking to the new wing. The addition of a personal care home wing includes a new, larger laboratory, new office and file space.

Radiology: Western Region (Cont.)

Rossburn - held the official opening of their new District Health Centre in the Spring of 1982 which includes a complete new Laboratory and X-ray Services suite. New major instrumentation introduced were the Pako 14 XTCW film processor and an integrated table-tube stand x-ray system for general radiography.

Hamiota - renovations of the Laboratory and X-ray Section were completed in March, 1983, which saw expansion of the Laboratory, changes in the reception area, waiting room, washrooms, and new change rooms, ECG examination room, and storage and file rooms.

Killarney - a room in the hospital was converted to a dual purpose cast room and ancillary x-ray room complete with a bucky, stretcher and chest stand. Overflow work will be accommodated in this room using an x-ray mobile.

Benito - to improve the efficiency of this visitation department a new darkroom was installed adjacent to the x-ray room.

LABORATORY & X-RAY SERVICES DIVISION

ULTRASOUND STATISTICS

1982/83

UNIT	TOTAL	IN-PATIENT	OUT-PATIENT
* Winkler	542	52	490
**Dauphin	756	100	656
***Swan River	53	6	47
**The Pas	630	140	490

* Statistics dating from November, 1982.

** Statistics dating from October, 1982.

***Statistics dating from December, 1982.

LABORATORY MEDICINE EDUCATION

General:

During the 1982/83 fiscal year, our efforts to make available Laboratory Medicine Education (LME) resources that can be utilized by individuals at a distance from our central resources have increased. An additional 12 programs were acquired from the Center for Diseases Control in Atlanta, Georgia, to a total of 24 programs of this kind. These programs consist of a text, visual slides, and an audio tape. Each program covers a specific topic related to laboratory medicine and many run up to one hour. The programs can be studied by individuals or by groups, at a minimum cost to the Division, and at a maximum convenience to the participants. During the year, these programs were utilized 401 times (one utilization = one person completing one program).

Doctor Williams, and invited specialists, continued the Division's on-site visitation programs. While at these visits, formal and informal presentations are brought to rural physicians, technologists and auxilliary staff. Sixty-four such visits were made over the year, presenting topics as: Hepatitis B Vaccine; Toxic Shock Syndrome; AIDS; Medication of the Elderly; Viral Diagnosis and Therapy; Food Poisoning; Newer STD's; and the Cephalosporins.

The success of these programs is measured, in part, by the high attendance and interest shown by the target groups. In all, 507 individuals attended these programs: 261 physicians, 113 technologists, and 133 others.

The Division is highly appreciative of the contributions made by the many specialists who took part in this program by providing their time and expertise.

R.T. Training:

The Cadham Provincial Laboratory continued its rule in the training of candidates toward certification as Registered Technologists with the Canadian Society of Laboratory Technologists. Two categories of candidates are being trained:

1. R.T. General Candidates - This program is run in conjunction with Red River Community College, where students receive a 10 month didactic program, and the Grace Hospital, where students receive the major portion of their 12 months of practical training. At Cadham, students receive a 13 week practical training in the discipline of Clinical Microbiology. Four students completed this program during the year.

...Cont.2

Laboratory Medicine Education (Cont.)

2. R.T. Subject Candidates - These programs are designed to train specially selected candidates for a minimum of one year in a specific discipline.

   In 1982, two CPL staff graduated from this program.

L.A.Training:

The Division continued to conduct a 12 week program to train selected Registered Radiological Technologists in the elementary practice of laboratory medicine. In this program, candidates receive six weeks of didactic training at the Cadham Provincial Laboratory, followed by six weeks guided practice in one of our larger rural Units.

During the year, two classes were conducted in this program, with 10 candidates graduating.

Inservice Training:

This area of training may be categorized in five distinct formats:

1. Simple rundowns on routine operations by on-line staff, particularly to new staff and summer students.

2. Introductions to new tests or instruments. This may involve:

   a. Familiarization by a sales representative or a senior staff member, see listing.

   b. A pre-test, a guide on basic relevent knowledge.

   c. Practice under supervision with guidance and explanation of an instructor.

   d. A practical test to demonstrate competence in all procedural aspects.

   e. A Post-test to demonstrate an understanding of principles, applications and pitfalls.

3. Topical lectures by senior staff or guests, see listings and general narrative.

4. Formal programs that require more in-depth involvement and longer time commitments from both the participant and the instructor.

... Cont. 3

Laboratory Medicine Education (Cont.)

One such program is a ten lesson correspondence course in Urinalysis developed and administered by the co-ordinator LME. This year, 11 individuals have completed a total of 26 lessons, with three completing the entire course.

With the introduction of metric to health care in July of 1982, a major drive was undertaken to introduce laboratory workers across the Province to the System International and its applications to laboratory analyses. The entire Procedures Manual was revised, and 18 workshops were conducted at various locations. A total of 188 individuals attended these workshops.

Specific activities under categories 2, 3, and 4 are listed below. The figures in brackets represent the number of staff in attendance:

Microbiology upgrading at C.P.L.	Wpg.	1 week	(2)
Early Management of Multiple Traumas	Dauphin	1 hour	(11)
Immunohematology - Ortho	Dauphin	6 hours	(10)
- Red Cross	"	1 "	(6)
Safety is it Not Worth It	Dauphin/Wpg.	1 hour	(14)
Northern Medicine	Dauphin	"	(6)
Screening for Lung Cancer	"	"	(10)
BioSafety Seminars	Wpg.	2 hours	(16)
Fire Safety Workshop	"	1 hour	(12)
Hemac Maintenance Workshop	Portage	4 hours	(4)

Extramural Training:

Several staff members were assisted or partook in external training programs on their own account:

Enzymology	Brandon	5 hours	(1)
Stress Management	Winnipeg	8 "	(1)
Diagnostic Microbiology	U of M	2 Terms	(3)
Diagnostic Parasitology	U of M	1 Term	(4)
Intestinal Parasitology	T.I.M.T. Corr.	60 hours	(1)
Clinical Microbiology	" "	100 "	(1)
Myeloproliferate Disorders	" "	100 "	(1)
Photomicrography	" "	30 "	(1)
Parkland Academy Seminars	Dauphin	6 "	(16)
Normalt Academy Seminars	The Pas	8 "	(21)

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Laboratory Medicine Education (Cont.)

Microbiology - Update	S.A.I.T. Corr.	125	hours	(2)
Coagulation	C.S.L.T. Corr.	25	"	(1)
Hematology - Update	S.A.I.T. Corr.	125	"	(1)
Winnipeg Academy Seminars	Winnipeg	6	"	(7)
Advanced Clin. Chemistry	Winnipeg	24	"	(5)
First Aid	Altona	80	"	(1)
Health and Safety	Gimli	18	"	(1)
Heptavax	Montreal	12	"	(1)
C.S.L.T.-National Congress	Regina	1-5	days	(7)
A.S.M. Annual Meeting	New Orleans	4	"	(1)
Cdn. Assoc. Public Health	Toronto	3	"	(1)
Land Disposal of Sludge Seminar	Calgary	3	"	(1)

Extramural Teaching:

A number of our staff continued to contribute a significant amount of time to teaching at the University of Manitoba. Such activities include lectures, seminars, tutorials, rounds and laboratory sessions for a variety of students. They include the total responsibility for such graduate courses as Clinical Parasitology and Clinical Virology.

Other presentations of note:

- Billings, R.
  Application of SI-Units
  Nurses and Auxilliary Personnel, Morden, 1982

- Delaat, A.N.C.
  Medical Technology Education: A dilemma and a challenge,
  C.S.L.T. Congress, Regina, 1982

- Delaat, A.N.C., Ronald, A. and Hardy, G.,
  Trouble shooting in Microbiology; discussion panel,
  C.S.L.T. - Congress, Regina, 1982

- Delaat, A.N.C.
  Training of Deer Lodge and St. Boniface Hospital students
  in Laboratory Technology

- Fox, J. G.
  Linkage between the laboratory and VD-Control,
  Med. Officers of Health - Conference, Winnipeg, 1982

- Giercke, S.
  Diagnostic Microbiology,
  Infectious Disease Control Officers Groups, Winnipeg, 1982/83

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Laboratory Medicine Education (Cont.)

- Hammond, G.W.
  The Incidence of Sequelae of C.N.S. Infections in Manitoba, 22nd Interscience Conf. Microbial Ag. and Chemotherapy, Miami, 1982.

- Hammond, G.W.
  Absenteeism of Hospital Staff during Flu Epidemics, 5th International Congress of Comp. Virology, Banff, 1982

- Hammond, G.W.
  Counterimmunoelectrophoresis for the Diagnosis of Rotavirus infections, 50th Conjoint Meeting of Inf. Disease, Toronto, 1982.

- Hammond, G.W.
  The Laboratory Diagnosis of Viral Sexually Transmitted Diseases, 1st. Canadian Meeting on S.T.D., Toronto, 1982

- Maniar, A.C.
  Red River Water Polution,
  Manitoba Environmental Council, Winnipeg, 1982

- Maniar, A.C., et al,
  Comparison of McCoy vs Hela cells for the detection of Clostridium difficile toxin, A.S.M. - Annual Meeting, New Orleans, 1983.

- Sekla, L.
  Hepatitis and Nurses,
  Assoc. Obs. & Gyn. Nurses, Winnipeg, 1982

- Sekla, L.
  Mosquito-borne arboviruses in Manitoba,
  Post-Grad. Zoology, U of M, Winnipeg, 1982

- Sekla, L.
  Laboratory Diagnosis of food poisoning,
  Laboratory diagnosis of hepatitis,
  Med. Officers of Health Conference, Winnipeg, 1982

- Sekla, L.
  Diagnosis of Brucella,
  Health and Welfare Canada, Winnipeg, 1982

- Sekla, L.
  Micro-organisms in drinking water,
  Public Health Inspectors-Health and Welfare, Winnipeg, 1983

- Sekla, L.
  Red River Microbiology,
  Legislative Building Seminar, Winnipeg, 1982

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Laboratory Medicine Education (Cont.)

- Sekla, L.
  Parasites in Manitoba
  Infectious Disease Control Nurses, Winnipeg, 1982

- Sekla, L.
  Laboratory Diagnosis of Western Equine Encephalitis,
  Clean Environment Commission, Winnipeg, 1982

- Sekla, L.
  Hepta Vax-B-Grand Round,
  Health Sciences Campus, Winnipeg, 1982

- Sekla, L. and Stackiw, W.
  Land Disposal of Municipal Sludge and Effluent,
  Int. Conf. Biohazards of Sludge Disposal, Calgary, 1983

- Stackiw, W.
  Viruses in Water and Waste Water in Manitoba,
  West Can. Water and Waste Conference, Kananaskis, 1982

- Stackiw, W.
  Clinical Virology, H.S.C. - Laboratory Technology Students,
  Winnipeg, 1982
  Red River Community College, Winnipeg, 1982
  Serology, H.S.C. - Infectious Disease Residents, Winnipeg, 1982

- Stackiw, W.
  Virology of Arboviruses,
  Micro. Post-Grad. Students, U of M, Winnipeg

- Stackiw, W.
  Microbiology of Water and Waste,
  Man. Water and Waste School, Winnipeg, 1982

- White, G. and Maxwell, T.
  Application of S.I. - Units,
  Physicians and Nurses, Dauphin, 1982

- Williams, T.
  AIDS and Hepatitis,
  Med. Lab. Students, R.R.C.C., Winnipeg, 1982

- Wilt, J.C., Fox, J.G. and Williams, T.,
  Historical Perspectives; Panel Discussions,
  Chlamydia Days - Symposium, U of Manitoba, Winnipeg, 1982

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Laboratory Medicine Education (Cont.)

Vocational Guidance:

Various staff members participated in career day activities at a number of high schools throughout the Province. Special sessions with premedical students were also conducted at the University of Winnipeg, and in Winkler.

Career guidance was also provided on an individual basis to various staff members, some recent immigrants, and to summer students.

Mr. A. Delaat and Dr. A. Maniar participated as judges at the annual School Science Fair and Symposium.

Laboratory Safety:

The Divisional Laboratory Safety Officer continued his monitoring and review of safety practices and standards throughout the Division. During the year, 7 facilities were thoroughly inspected, and several consultations were offered.

A fire safety workshop was conducted at the Cadham Laboratory. The movie "Safety, Isn't It Worth it" was shown in four locations.

Publications:

1. Delaat, A.N.C.,
Biosafety and the Clinical Laboratory,
Ontario J. Med. Technol., 3:#4, 5-9, 1982

2. Delaat, A.N.C.,
Microbiologia, 2nd. Ed.,
Interamericana, Mexico City, 1983

3. Dzogan, S.R.,
The use of immune electron microscopy for the detection of viruses in the environment, with possible application to a diagnostic laboratory, Canad. Soc. Lab. Technol., Hamilton, ON., 1983.

4. Fox, J. G.,
The case for control of WEE in humans through vaccination, Ministry of Health, Manitoba, Winnipeg, 1982.

5. Hammond, G.W., Ahluwalia, G., Barker, R., Horsman, G., and Hazelton, P.R. Evaluation of a Direct and Indirect Enzyme Immunoassay Vs. Direct Ultracentrifugation Preceding Electron Microscopy for Detection of Rotaviruese. J. Clin. Microbiol. 16: 53-59, 1982.

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Laboratory Medicine Education (Cont.)

6. Hammond, G. W., and Hazelton, P. R. The use of electron microscopy for viral diagnosis at the University of Manitoba. Norelco Reporter 29: 23-27, 1982.

7. Hammond, G. W., Noble, G. R. and Smith, S. J. Lack of Parallelism of EIA-measured Antibody Responses with Convalescence from Influenza A/USSR/77 (H_1N_1) Infections. J. Infect. Dis. 146: 827, 1982.

8. Hawryluk, G., Hammond, G. W. and Friesen, B. Neuropsychological Sequelae After Western Equine Encephalitis Virus Infection. Published in Western Equine Encephalitis in Manitoba, Government of Manitoba Publication, March 1983.

9. Hoare, R.,
Monitoring of pesticide effects on Humans by cholinesterase testing, Ministry of Health - Manitoba, Winnipeg, 1982.

10. Kordova, N., Wilt, J.C., Sekla, L., Wenman, W., Stackiw, W., and Feltham, S.,
New Commercial Chlamydial antigens in the serology of chlamydial infections in a selected population of the Province of Manitoba, Canad. J. P.H., 73: - , 1982

11. Sekla, L. and Stackiw, W.,
Arbovirus isolations and serology in Manitoba,
Ministry of Health-Manitoba, Winnipeg, 1982.

12. Sekla, L. and Stackiw, W.,
Arbovirus isolations from mosquitoes in Manitoba,
Ministry of Health, Manitoba, Winnipeg, 1982.

13. Sekla, L.,
Manitoba Arbovirus surveillance committee: Historical review, terms of reference and structure, Description of the Surveillance Program, Ministry of Health - Manitoba, Winnipeg, 1982.

14. Sekla, L., Stackiw, W., Barker, R. and Eadie, J.,
Legionnaires' Disease - Manitoba,
Canad. Dis. Wkl, 8:28, 1982.

15. Sekla, L., Editor,
Western Equine Encephalitis Symposium,
Ministry of Health, Manitoba - Winnipeg, 1983.